

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
SPECIFICATION FOR
TANK, METAL, FIRE, BACKPACK

1. SCOPE.

1.1. Scope. The backpack metal tank described in this specification is designed for use with a hand operated slide action pump used in wildland firefighting activities. The tank is made of a lightweight metal. Handles are provided and attachments are included for backpacking. The discharge is equipped with a quick connect coupler for hand-operated pump hose connection. The pump can be attached to a swivel snap fastener installed on the backpack straps allowing hands-free movement.

2. APPLICABLE DOCUMENTS.

2.1. Government Documents. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issue of these documents are those in effect on the date of the invitation for bids or request for proposals (see 6.2).

USDA Forest Service Specifications and Drawings

- 5100-217 - Harness, Field Pack, Firefighters
- 5100-256 - Pump, Fire, Backpack, Hand-Operated
- 5100-103 - Water Bag, Suppression, 5 Gallon, Nylon Duck (With Replaceable Liner)
- MTDC 713 - Harness, Field Pack, Firefighters, M-1986
- MTDC 714 - Equipment Belt, Field Pack, Firefighters, M-1983
- MTDC 832 - Water Bag, Nylon Duck, 5 Gallon, Suppression

Military Standard

- MIL-W-530 - Webbing, Textile, Cotton, General Purpose, Natural or in Colors

Beneficial comments, recommendations, additions, deletions and any pertinent data that may be used in improving this document should be addressed to: USDA Forest Service, San Dimas Technology and Development Center, 444 East Bonita Avenue, San Dimas, CA 91773-3198 by using the Specification Comment Sheet at the end of this document or by letter.

Copies of federal and military standards are available from General Services Administration, Federal Supply Service Bureau, Specification Section, Suite 200, 470 East L'Enfant Plaza SW, Washington DC 20407.

Copies of USDA Forest Service Specifications and Standards are available from USDA Forest Service, San Dimas Technology and Development Center, 444 East Bonita Avenue, San Dimas, CA 91773-3198.

2.2. Non-Government Publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those in effect on the date of the invitation for bids or request for proposals.

American National Standards Institute (ANSI) / American Society for Quality Control (ASQC)

Z 1.4 - Sampling Procedures and Tables for Inspection by Attributes

Address requests for copies to the American National Standards Institute Inc., 11 West 42nd Street, New York, NY 10036.

American Society for Testing and Materials (ASTM)

A 525 - Steel, Sheet, Zinc-coated (Galvanized) by the Hot-dip Process, General Requirements

E 380 - Practice for Use of the International System of Units

Address requests for copies to American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

2.3. Order of Precedence. In the event of conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS.

3.1. Qualified Products List Number. The bidder shall possess a currently valid notice of qualification with associated Qualified Products List (QPL) number obtained in accordance with 4.1. The date of issue on the QPL number shall precede the date on the invitation for bids. The tank shall be qualified as galvanized steel or stainless steel, with a capacity of 4 gallons (15.2 liters).

3.2. Construction.

3.2.1. Metal Tank. The tank shall be rigid, form-fitted and kidney shaped, as viewed from above. The top shall be sufficiently convex to prevent air entrapment. The bottom shall be flat. The tank shall include a filler neck with strainer and cap, inner baffle, handle on the top plate, and a quick connect coupler on top or optional side. Backpack strap attachments shall be located on the contoured side of the tank. See Figure 1 for configuration. Figure 1 is provided for information only and is not intended to designate a particular design or manufacturer. The volumetric capacity shall be 4 gallons (15.2 liters). See 3.7.1.

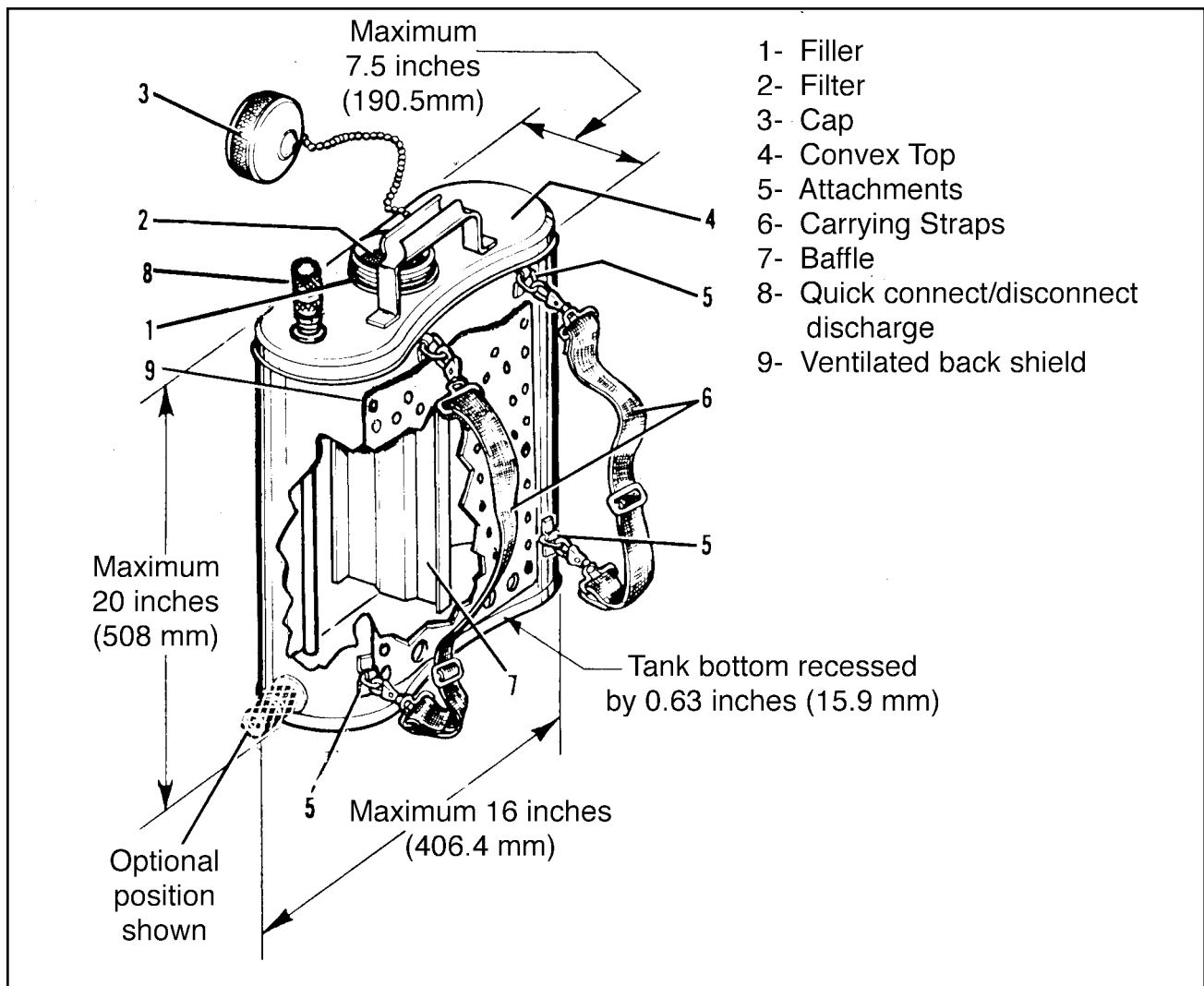


Figure 1. Metal Backpack Tank Configuration.

3.2.2. Tank Components.

3.2.2.1. Inner Baffle. An inner baffle shall be centrally installed between the front and back walls and shall run at least 75 percent of the length from the bottom of the tank to the bottom of the strainer. There shall be a minimum 0.5 inch (12.7 mm) clearance at the top and bottom of the baffle. The baffle may be corrugated to increase strength.

3.2.2.2. Ventilated Back Shield. A back shield shall be permanently fastened to the contoured wall as shown in Figure 1. There shall be an air space between the tank and the back shield. Ventilating holes shall be included in the back shield.

3.2.2.3. Filler Neck. The filler neck shall be centrally located on the convex top plate with a minimum 3.5 inch (89 mm) diameter opening. It shall be threaded or fabricated to match the cap in 3.2.2.5.

3.2.2.4. Filler Neck Strainer. A strainer shall be included in the filler neck. It shall lock in place to hold it in the filling neck and still be removable. The strainer shall be capable of straining out particles larger than 0.0625 inch (1.588 mm) in diameter.

3.2.2.5. Filler Cap and Gasket. The filler cap shall be constructed with threads or prongs matching the filler neck. A gasket shall be included. The filler cap shall mate with the filler neck. A minimum 0.125 inch (3.175 mm) vent hole shall be centrally located in the cap with a check valve device to prevent leakage. The cap shall be fastened to the tank with a minimum 6 inch (152 mm) bead chain to prevent loss.

3.2.2.6. Carrying Handle. The carrying handle shall have a minimum length of 4.5 inches (114 mm) and shall be attached to the central part of the top plate without interfering with the filler cap installation and removal. An adjustable bracket or spring clamp shall be provided to secure a pump described in USDA Forest Service Specification 5100-256. The pump shall have a minimum diameter of 0.87 inch (22.1 mm) and a maximum of 1.25 inch (31.8 mm).

3.2.2.7. Quick-Connect Coupler. The quick-connect coupler discharge shall be a 3/8 inch 18 NPT external threaded internal coupler, with a minimum waterway of 0.25 inch (6.35 mm). The coupler shall be positioned on the tank top plate as shown in Figure 1. This coupler shall mate with the external coupler section from the slide action pump, described in USDA Forest Service Specification 5100-256. The coupler shall have an automatic positive shutoff when disconnected. The coupler shall have the properties indicated in Table 1. Quick-connect couplings listed in Table 2 have been previously evaluated as meeting the physical property requirements of Table 1. The quick connect couplers shall be fully interchangeable between products.

Table 1. Quick-Connect Coupler Physical Properties

Physical Property	Requirement
Rated working pressure	300 psi (2.07 MPa)
Temperature range (standard seals)	-40 to 250 °F (-22.2 to 121.1 °C)
Locking device	8 balls
Force required to connect	32 lbf to 37 lbf (142 N to 165 N)

Table 2. Quick-Connect Couplings - Internal Threads

Product	Manufacturer
Amflo Part Number C5	Amflo Products, Inc. 1430 S. Anaheim Blvd Anaheim, CA 92805
D.B. Smith Part Number 176050	D.B. Smith and Company 414 Main Street Utica, NY 13501
H.D. Hudson Part Number 144-440	H.D. Hudson Manufacturing Company 1130 17th Street NW, Suite 300 Washington DC 20036
Parker Hannifin Part Number P14N and Tru-Flate Series 10 Coupler Part Number 14	Quick-Coupling Division, Parker-Hannifin 8145 Lewis Road Minneapolis, MN 55427

3.2.3. Backpack Carrying Strap Attachments. Backpack carrying strap attachments shall be permanently located on the tank contoured wall beside the backrest. There shall be a total of 4 attachments. Two attachments shall be spaced 5.0 to 7.5 inches (127 to 191 mm) apart at the top section of the tank adjacent to the back shield. The other two attachments shall be spaced 11 to 13 inches (279 to 330 mm) apart at the lower section, and between 3 to 5 inches (76 to 127 mm) from the bottom. The attachments shall be equipped with D-rings. Alternate attachment points for the upper two locations may consist of two holes in the carrying handle bracket. See Figure 2.

3.2.4. Backpack Carrying Straps. Two standard backpack carrying straps shall be supplied with each metal tank. The straps shall be padded and shall be a minimum 2.5 inches (64 mm) wide by 12 inches (305 mm) long at the top section and minimum 1 inch (25.4 mm) wide and 25 inches (635 mm) long at the bottom section. Straps shall be provided with hardware that can adjust the overall length to a minimum 26 inches (660 mm). See Figure 2. An adjustable swivel, with snap type fastener, or self-closing clip with a maximum length of 3 inches (76 mm), shall be attached midway on the strap nearest the quick connect and intended to carry a hand-operated pump as described in USDA Forest Service Specification 5100-256. The end of the standard backpack carrying straps shall be supplied with split rings of a minimum diameter of 0.5 inch (12.7 mm).

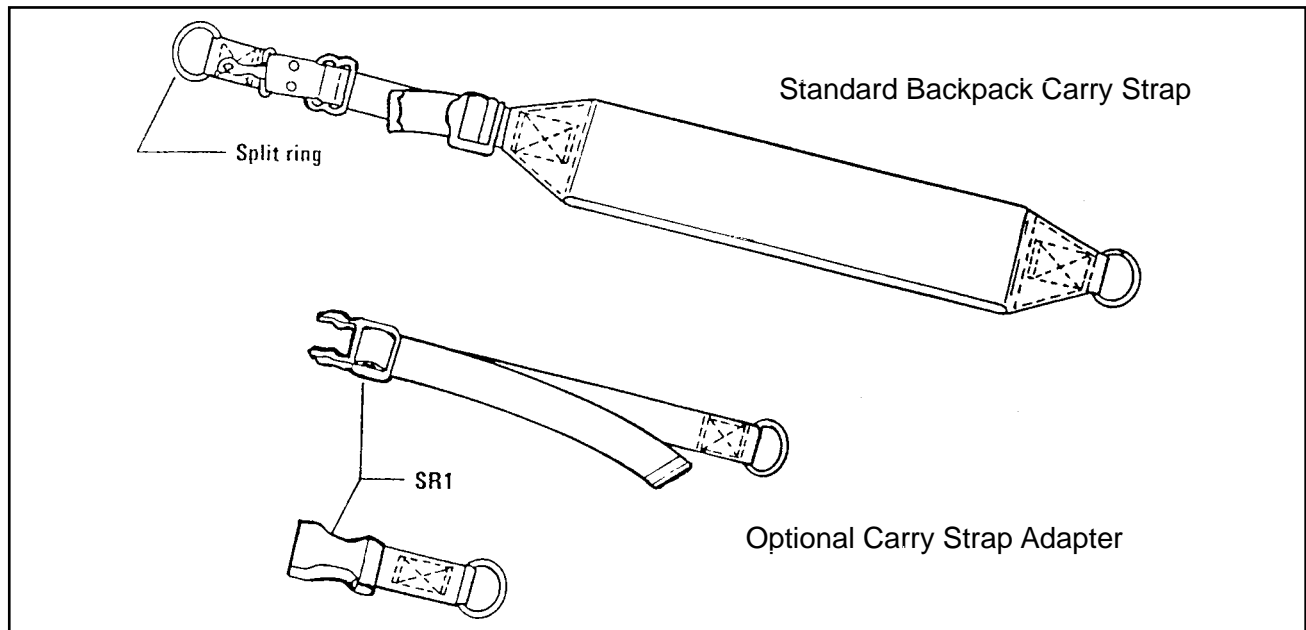


Figure 2. Standard Backpack Carrying Strap and Optional Backpack Carrying Adapter Configurations.

3.2.5. Optional Backpack Carrying Strap Adapters. The optional backpack carrying strap adapters are intended to allow the metal backpack tank to utilize the harness assembly of the 5 gallon (18.9 liters) waterbag system specified by USDA Forest Service Specification 5100-103 and Drawing MTDC 832; and the field pack harness and belt assembly specified in the USDA Forest Service specification 5100-217, Drawings MTDC 713, and MTDC 714. Four type B carrying strap adapters will be necessary for use with the waterbag harness. Two type A adapters and two type B adapters will be necessary for use with the field pack harness and belt.

3.2.5.1. Type A Carry Strap Adapter. Type A carry strap adapter shall be constructed of nylon webbing, type IV, size 0.75 inch (19.05 mm), color black of MIL-W-43668. It shall have a minimum length of 12 inches (305 mm), when adjusted to the maximum length. It shall have an external threaded 0.75 inch (19.05 mm) side release black acetal buckle on one end and a split ring, minimum diameter 0.5 inch (12.7 mm) on the other end. The strap adapter shall be configured similar to Figure 2: Optional Carry Strap Adapters, top strap. The external threaded 0.75 inch (19.05 mm) side release buckle shall be black acetal plastic conforming to ITW Waterbury Side Release Buckle part number 101-0075; American Cord and Webbing Side Release Buckle, part number BSR - 3/4; or National Molding Corporation Mojave Side Squeeze Buckle part number 5205.

3.2.5.2. Type B Carrying Strap Adapter. Type B strap adapter shall be constructed of nylon webbing, type III or type III Alternate, size 1.0 inch (25.4 mm), color black of MIL-W-43668. It shall have an internal threaded 1.0 inch (25.4 mm) side release black acetal plastic buckle on one end and a 0.5 inch (12.5 mm) minimum diameter split ring on the other end. The strap adapter shall only be long enough for a secure "box-x" stitch between the ends. The strap adapter shall be configured similar to Figure 2: Optional Carry Strap Adapters, bottom strap. The internal threaded 1.0 inch (25.4 mm) side release buckle shall be black acetal plastic conforming to ITW Waterbury Side Release Buckle, part number 101-0100; American Cord and Webbing Side Release Buckle, part number BSR-1; or National Molding Corporation Mojave Side Squeeze Buckle part number 5001.

3.2.6. Optional Vehicle Tank Mounting Bracket. A tank mounting bracket for attachment to a vehicle may be provided, as optional equipment. The bracket shall support the tank at the bottom in an upright position and have a quick-locking type tank fastener. Attachment to the vehicle shall be on the bracket side and bottom. If necessary, the bracket will have a slot to allow for location of side-mounted quick connect.

3.3. Materials. Where more than one type of material is used in various components, there shall be no incompatibility between materials which may cause corrosion.

3.3.1. Tank Material. Galvanized tank material shall be a minimum 26-gage galvanized steel sheet, in accordance with ASTM A 525. If otherwise specified, tank material should be stainless steel and shall contain all stainless steel components suitable for water service.

3.3.2. Attachment and Connection Materials. The tank baffle material shall be a minimum 26-gage sheet steel. The ventilated back shield material shall be a minimum 26-gage sheet steel. Metallic attachments such as D-rings or split rings shall be chrome-plated, stainless steel or brass suitable for water service. The tank filler neck, cap, and discharge connection shall be made of a corrosion resistant galvanized steel, stainless steel or brass material suitable for water service. The quick connect coupler shall be zinc plated, stainless steel or brass. The carrying handle shall be made of minimum 18-gage galvanized or stainless steel sheet.

3.3.3. Filler Neck Strainer Material. The filler neck strainer shall be made of galvanized wire, stainless steel, or brass. If stainless steel is used, it shall be a minimum 24-gage steel sheet or 25-gage wire. If brass is used, it shall be a minimum 0.020 inch (0.508 mm) thickness.

3.3.4. Backpack Carrying Strap Material. The backpack carrying straps described in 3.2.4, shall be cotton, nylon, or polypropylene webbing. Strap material shall be treated for mildew resistance and shall be water repellent. A minimum of a 12 inch (305 mm) length of polyurethane padding shall be enclosed at the top end of the straps. The cotton webbing shall be Type III, Class 4, olive drab 7 in accordance with MIL-W-530. The nylon or polypropylene webbing shall be 100 percent olefin continuous multi-filament number 840-denier/140-filament yarn.

3.3.4.1. Backpack Carrying Strap Material Tear and Breaking Strength. After the mildew resistance and water repellent treatment, the material strength shall be measured. The fabric shall have a minimum weight of 4.8 oz/yd² (0.65 kg/m²), a minimum tear strength of 16 pound force (71 N) warp by 16 pound force (71 N) filling. In addition, the fabric shall have a minimum breaking strength of 300 pound force (1334 N) warp, and a minimum 500 pound force (2224 N) filling.

3.3.4.2. Strap Color. The color of the straps shall be black or jungle green. The color of the strap as tested shall be the color of the strap supplied.

3.3.5. Recoverable Materials. The contractor is encouraged to use recovered materials to the maximum extent practicable, in accordance with paragraph 23.403 of the Federal Acquisition Regulation (FAR), provided all performance requirements of this specification are met.

3.4. Dimensions and Weights.

3.4.1. Weights. The dry weight of the tank with backpack straps shall not exceed 9 pounds (4.1 kg).

3.4.2. Dimensional Tolerance. Unless otherwise noted, the following tolerances apply: one place (x.x) ± 0.1 inch (2.5 mm); two places (x.xx) ± 0.01 inch (0.25 mm) and three places (x.xxx) ± 0.010 inch (0.254 mm). Commercial tolerances apply to holes, threads, slots, etc. produced by standard drills, taps mills, etc. Tolerances shall be: decimal ± 0.005 , angles ± 5 degrees.

3.5. Workmanship. Workmanship shall be equal to the best commercial practices consistent with the highest engineering standards in the industry and shall be free from any defect which may impair serviceability or detract from the product's appearance.

3.5.1. Symmetry. All metal part sections shall be symmetrical and concentric to 0.030 inch (0.762 mm).

3.5.2. Extruded or Forged Components. Extruded or forged sections shall be free from laps, sharp die marks, cracks and other defects.

3.5.3. Cast Components. Cast parts shall be fine-grained, free from blowholes, pinholes, pits, porosity, hard spots, shrinkage, cracks or other defects.

3.6. Marking. The tank shall be permanently and legibly marked on the outside with the name or trademark of the manufacturer, the letters, "FSS" and the date (month and year) of manufacture. The letter sizes shall be a minimum of 0.5 inch (12.0 mm), and the markings may be either embossed or stamped with permanent ink or paint on the tank. The markings may be located on a permanently attached metal plate.

3.7. Performance.

3.7.1. Tank Dry Weight and Capacity. When tested in accordance with 4.7.2, the tank shall be weighed dry and the volumetric capacity shall be 3.9 to 4.3 gallons (14.8 to 16.3 liters).

3.7.2. Strainer Flow Capacity. When tested in accordance with 4.7.3, tank strainer flow capacity shall be 20 gpm (75.7 Lpm) without overflowing.

3.7.3. Discharge Efficiency. When tested in accordance with 4.7.4, the tank shall not increase in weight greater than 1.0 pound (0.46 kg) from the dry weight, after pouring out contents. See 3.7.1. After discharge pumping from the tank, no more than 0.5 inch (13 mm) of water shall remain in the tank bottom in the vertical position. Repeat discharge pumping with the tank positioned forward at a 20 degree angle. Tank weight shall not increase more than 2.0 pounds (0.91 kg) over the dry weight, from water not discharged.

3.7.4. Tank Leakage. When tested in accordance with 4.7.5, there shall be no leakage from the tank. Small drips from the neck ring shall not constitute seam failure.

3.7.5. Filler Cap Leakage. When tested in accordance with 4.7.6, there shall be no leakage from the filler neck and cap.

3.7.6. Impact Resistance. When tested in accordance with 4.7.7, there shall be no separation of parts or damage.

3.7.7. Backpack Strap and Pump Attachment Clip Tension Capacities. When tested in accordance with 4.7.8, the backpack straps shall be capable of withstanding a tension force of 150 pound force (667 N). The pump clip attachment shall be capable of withstanding a tension force of 50 pound force (222 N). There shall be permanent deformation, mechanical damage or structural failure.

3.7.8. Split or D-Rings. When tested in accordance with 4.7.9, split rings shall be capable withstanding a tension force of 150 pound force (667 N). There shall be permanent deformation, mechanical damage or structural failure.

3.8. Metric Products. Metric dimensions are provided for information only, inch-pound units shall be the required units of measure for this specification. Thread series designation is indicated as external threaded 3/8 inch 18 NPT. Since this is a thread series designation, not an indication of a specific dimension, the metric equivalent is not given. Products manufactured to metric dimensions will be considered on an equal basis with those manufactured using inch-pounds units, provided they fall within the tolerances specified using conversion tables contained in the latest revision of ASTM E 380, and all other requirements of this standard are met.

4. SAMPLING, INSPECTION AND TEST PROCEDURES.

4.1. Qualification Testing.

4.1.1. Manufacturer Submission for Qualification Tests. The prospective contractor shall provide, without cost to the Government:

- a. Five complete sets or one reproducible set of detailed dimensional drawings and specifications.
- b. Two sample tanks with operating and maintenance instructions.
- c. Certificates of conformance.
- d. The estimated test fee. Contact the Water Handling Project Leader at the USDA Forest Service, San Dimas Technology and Development Center (SDTDC), 444 East Bonita Avenue, San Dimas, CA 91773.
- e. A signed collection agreement. Contact the SDTDC Water Handling Project Leader for a copy of the form.
- f. All of the above items shall be delivered to SDTDC to the attention of the Water Handling Project Leader.

The Government shall not be responsible for the submitted test samples.

4.1.2. Qualification Test. Qualification inspection and tests shall be conducted by the Government and at the expense of the contractor at a fee to be determined by the Government. If requested by the contractor, the Government will inform the contractor of date and place of inspection and tests. The contractor may send a representative (who has been designated in writing) to be present and observe the inspection and tests, but he/she will not be permitted to be a participant. Upon completion of tests, the test sample will be retained by the Government. Qualification testing shall stop on a single failure and the test sample rejected. The contractor will be informed as to the nature of the failure. The Government shall not be obligated to continue testing a defective item once it is known to be defective or when it is considered to be in the best interest of the Government.

4.1.3. Notice of Qualification. Notice of Qualification shall be issued to the contractor upon the successful completion of qualification tests. Copies of qualification notices shall be provided to the General Services Administration. A copy shall be retained in the SDTDC file.

4.1.4. Notice of Failure to Qualify. The contractor shall be notified by letter of a failure to qualify, if the submitted tank does not meet the requirements of this specification.

4.1.5. Re-qualification. After qualification, if any changes are made to the product or where it is manufactured, the contractor shall notify SDTDC immediately in writing. The need for requalification shall be determined by the Government when there are changes to the product or this specification.

4.2. General Inspection and Tests. Unless otherwise specified in the contract or purchase order, the contractor is responsible for performance of all inspection requirements prior to submission for Government acceptance inspection and tests. The contractor may utilize their own facilities or any commercial laboratory acceptable to the Government. Inspection records of the examination and tests shall be kept complete and available to the Government.

4.2.1. Inspection and Test Sites. The Government shall conduct lot acceptance inspection and tests to determine compliance with the specification. If lot acceptance and tests are conducted at locations other than the manufacturing facilities, the contracting officer will specify location and arrangements. In the case of on-site inspections at the contractor's facility, the contractor shall furnish the inspector all reasonable facilities for their work. During any inspection, the inspector may take from the lot one or more samples and submit them to an independent test laboratory approved by the Government or to a Government test facility for inspection and tests.

4.2.2. Testing With Referenced Documents. The contractor is responsible for insuring that components and materials used were manufactured, examined and tested in accordance with referenced specifications and standards. The Government reserves the right to perform any of the inspections or tests set forth in this section where such action is deemed necessary to assure supplies and services conform to prescribed requirements. All inspection or testing of a sample shall stop upon a single failure and the sample rejected. The contractor will be informed as to the nature of the failure. The Government shall not be obligated to continue testing a defective item once it is known to be defective or when it is considered to be in the best interest of the Government.

4.3. Responsibility for Compliance. All items shall meet all requirements of sections 3 and 4. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in this specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.4. Sampling for Inspection. When inspection is performed, sampling shall be in accordance with ANSI/ASQC Z 1.4.

4.4.1. Lot. All tanks of the same type, presented together in one delivery shall be considered a lot for the purpose of inspection. A sample unit shall be one tank.

4.4.2. Sampling for Visual and Dimensional Examination. Sampling for visual and dimensional examination shall be S-2, with an Acceptable Quality Level (AQL) of 1.5 percent defective.

4.4.3. Sampling for Lot Acceptance Tests. Sampling for lot acceptance testing shall be S-2 with an AQL of 1.5 percent defective.

4.5. Inspection and Tests.

4.5.1. Visual and Dimensional Examination. When selected in accordance with 4.4.2, each sample pump unit shall be visually and dimensionally examined to determine conformance with this specification. Visual or dimensional defects shall be classified as major or minor. A defect not listed in Table 3 shall be classified as a minor defect. If the number of defects in any sample exceeds the indicated AQL, the lot shall be rejected.

Table 3. Major and Minor Defects

Defect	Classification	
	Major	Minor
1. Metal tank assembly not complete.	X	
2. Materials or components not as required.	X	
3. Dimensions and weights not as required.	X	
4. Quick-connect couplings not as required.	X	
5. Markings not as required.		X
6. Workmanship not as required.		X

4.5.2. Lot Acceptance Tests. Each of the samples selected in accordance with 4.4.3, shall be tested in accordance with 4.7, to determine conformance with requirements of this specification.

4.5.3. Quality Conformance Inspection. Unless otherwise specified, sampling for inspection shall be performed in accordance with ANSI/ASQC Z 1.4. The inspection level and AQL shall be as specified in 4.4.3.

4.5.4. Rejected Lots. Rejected lots may be offered again for inspection provided the contractor has removed all non-conforming tanks. The inspector shall again select, inspect, and test samples from such resubmitted lots to determine conformance with this specification.

4.6. Certificate of Conformance. Where certificates of conformance are required, the Government reserves the right to verify test any such items to determine the validity of certification. These certificates shall be based on the testing of component materials and may be performed by the component material supplier. The contractor shall provide certificates of conformance for 3.2.2.7, 3.3.1, 3.3.2, 3.3.3, 3.3.4, 3.3.4.1 and 3.3.4.2 (see 4.6.3, 4.6.4, 4.6.5, 4.6.6, 4.6.7, 4.6.8 and 4.6.9).

4.6.1. Certification. The contractor shall provide certificates of conformance for all materials used in the manufacture of an item. The contractor shall provide the following information on certificates of conformance:

- a. Material description, i.e. Aluminum 6061, T6; rubber sheet material for gaskets
- b. Specification, Standard or Test Method (include type, class, and form when applicable)
i.e. ASTM D2240, ASTM D412, or MIL-A-8625, Type III, Class 1
- c. Lot or batch number
- d. Test company name, address, and telephone number
- e. Test technician/Quality Assurance Manager's name and title
- f. Test date

4.6.2. Test Results. The contractor shall maintain complete records, including test results. At the request of the government, the contractor shall provide test results and other records, as described in the certificates of conformance, for all materials used in the manufacture of an item.

4.6.3. Certificates of Conformance in Lieu of Testing. Unless otherwise specified, certificates of conformance may be acceptable in lieu of testing end items.

4.6.4. Quick-Connect Coupler Physical Properties. As required in 3.2.2.7 and Table 1, the quick connect coupler shall meet the indicated material physical property requirements listed.

4.6.5. Tank Material. As required by 3.3.1, tank material shall meet the indicated material physical property requirement listed, when tested to defined test method.

4.6.6. Attachment and Connection Materials. As required by 3.3.2, the indicated components shall meet the indicated material physical property requirements listed.

4.6.7. Filler Neck Strainer Material. As required by 3.3.3, the filler neck strainer material shall meet the indicated material physical property requirements listed.

4.6.8. Backpack Straps. As required in 3.3.4, the backpack straps shall meet the indicated material physical properties requirements listed, when tested to defined test method.

4.6.9. Strap Material Tear and Breaking Strength. As required by 3.3.4.1, the backpack strap material tear and breaking strength test values shall meet the indicated material physical property requirements listed.

4.7. Performance Testing. Samples shall be subjected to the following tests to determine if the samples meet the requirements of the specification.

4.7.1. Fluid Medium. All testing requiring the use of a fluid medium shall be performed using municipally supplied potable water; this shall include, but is not limited to tank capacity and strainer flow capacity testing. If the contractor does not have access to a municipal water supply, the testing shall be performed using any clear fresh water normally available for firefighting. Testing performed by the Government will be conducted using municipally supplied potable water.

4.7.2. Tank Dry Weight and Capacity Test. As required by 3.7.1, the tank shall be weighed and volumetric capacity measured. The tank shall be weighed dry before any testing begins. The amount of water poured into the tank shall be measured. Fill to the top of the filler neck. An alternate method involves calculating the weight of the water.

4.7.3. Strainer Flow Capacity Test. As required by 3.7.2, the strainer in the tank shall be tested for flow capacity. With the tank strainer placed in the tank filler neck or in another suitable test fixture, water shall be directed into the strainer at a rate of 20.0 gpm (76.0 Lpm) to determine if the water backs up, fills the strainer, and flows over the top.

4.7.4. Tank Discharge Efficiency Test. As required by 3.7.3, the tank shall be tested for discharge efficiency. The tank shall be partially filled with water, then emptied through the filler neck by inverting the tank. The tank shall be turned upright and weighed, to determine the amount of water remaining in the tank. There shall be no increase in weight greater than 1 pound (0.46 kg). The tank shall be partially filled with water again and a qualified hand-operated pump (preferably from the same manufacturer) shall be attached to the quick-connect coupler. With the tank in an upright vertical position, pumping action shall be started and continued until water ceases to flow. The depth of the water remaining in the tank shall be measured with a ruler positioned through the filler neck. The tank shall be partially filled with water again and the same pumping procedure repeated except that the tank shall be tilted forward to a 20-degree angle (normal carrying position). Weight shall not increase more than 2.0 pounds (0.91 kg) over the dry weight, from water not discharged.

4.7.5. Tank Leakage. As required by 3.7.4, the tank shall be tested for leakage. The tank shall be positioned with the filler neck in the upright position. The tank shall be filled to the top of the filler neck. The tank shall be connected to a low-pressure water source through the quick-connect coupler, with the tank filler cap installed after all air has been removed from the tank. Apply a hydrostatic pressure of 3 ± 0.2 psig (21 ± 1.4 kPag). Hold pressure for 3 minutes. Inspect for leakage.

4.7.6. Filler Cap Leakage. As required by 3.7.5, the tank shall be tested for leakage at the filler neck, cap and cap check valve. Fill the tank, seal the cap and invert the tank. Check for leakage at the filler neck and cap.

4.7.7. Impact Resistance Test. As required by 3.7.6, the tank shall be tested for impact resistance. The tank shall be filled with water up to 2 ± 1 inch (51 ± 25 mm) from the top of the filler neck and the cap installed. Temperature of the water to fill the tank shall be between 65 and 75 °F (18.3 and 23.9 °C). The tank shall be dropped in a free fall from a height of 42 to 45 inches (1.1 m to 1.15 m) onto a flat concrete surface. The tank without straps, shall be dropped six consecutive times from six different positions to impact at six different points on the tank. The tank shall be examined after the sixth drop for separation of parts.

4.7.8. Backpack Strap Tension Capacity Test. As required by 3.7.7, both backpack straps shall be tested for tension capacity. Tension capacity testing shall be conducted using a tension machine or by the dead weight test method. The straps shall be mounted on a tension testing machine for application of tension force on the straps (clip ends and webbing) at a rate of 0.2 inch/min (0.508 mm/min) up to 150 pound force (667 N). In addition, the pump clip attachment on the strap shall be mounted on the tension testing machine and a tension force between the webbing and pump carrying attachment clip ends shall be applied at a rate of 0.2 inch/min (0.508 mm/min) up to 50 pound force (222 N). The attachments shall be inspected for failure.

4.7.9. Split Rings or D-Rings. As required by 3.7.8, backpack split rings or D-rings shall be tested at a minimum 150 pound force (667 N) tension force, with the test setup as described in 4.7.8. Tension capacity testing shall be conducted using a tension machine or by the dead weight test method.

5. PACKAGING, PACKING AND MARKING.

5.1. Packaging, Packing and Marking. The packaging, packing and marking shall be as specified in the contract or order.

6. NOTES.

6.1. Intended Use. The backpack metal tank described in this specification is designed for use with a hand operated slide action pump used in wildland firefighting activities. The tank is made of a lightweight metal. Handles are provided and attachments are included for backpacking. The discharge is equipped with a quick connect coupler for hand-operated pump hose connection. The pump can be attached to a swivel snap fastener installed on the backpack straps.

6.2. Acquisition Requirements. Acquisition documents, such as Invitation For Bids and Request For Proposals should specify the following:

- a. Title, number and date of this specification.
- b. If tank material other than galvanized steel is specified, the tank material should be stainless steel and shall contain all stainless steel components suitable for water service.
- c. If vehicle tank mounting bracket is required (see 3.2.6).
- d. If certificates of conformance are acceptable in lieu of lot by lot testing (see 4.6).
- e. Packaging, packing and marking (see 5.1).
- f. Date of the invitation for bids or request for proposals (see 2.1).

6.3. Qualification. The contracting officer should verify that the bidder possesses a currently valid notice of qualification with associated Qualified Products List (QPL) number obtained in accordance with 4.1. This QPL shall have already been obtained with a date of issue prior to the date of invitation for bids.

6.4. Notice. When Government drawings, documents, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever.

6.5. Preparing Activity. USDA Forest Service, San Dimas Technology and Development Center, 444 East Bonita Avenue, San Dimas, CA 91773-3198.

**United States Department of Agriculture, Forest Service
Standardization Document Improvement Proposal**

Instructions: This form is provided to solicit beneficial comments which may improve this document and enhance its use. Contractors, government activities, manufacturers, vendors, or other prospective users of this document are invited to submit comments to the USDA Forest Service, San Dimas Technology and Development Center, 444 East Bonita Avenue, San Dimas, California 91773-3198. Attach any pertinent data which may be used in improving this document. If there is additional documentation, attach it to the form and place both in an envelope addressed to the preparing activity. A response will be provided when a name and address are included.

Note: This form shall not be used to submit request for waivers, deviation, or for clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

Standard Number and Title: **Specification 5100-257c, Tank, Metal, Fire, Backpack**

Name of Organization and Address:

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